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UK CL (Edition M) E1J JB JCH JCN JCX JDH JDN

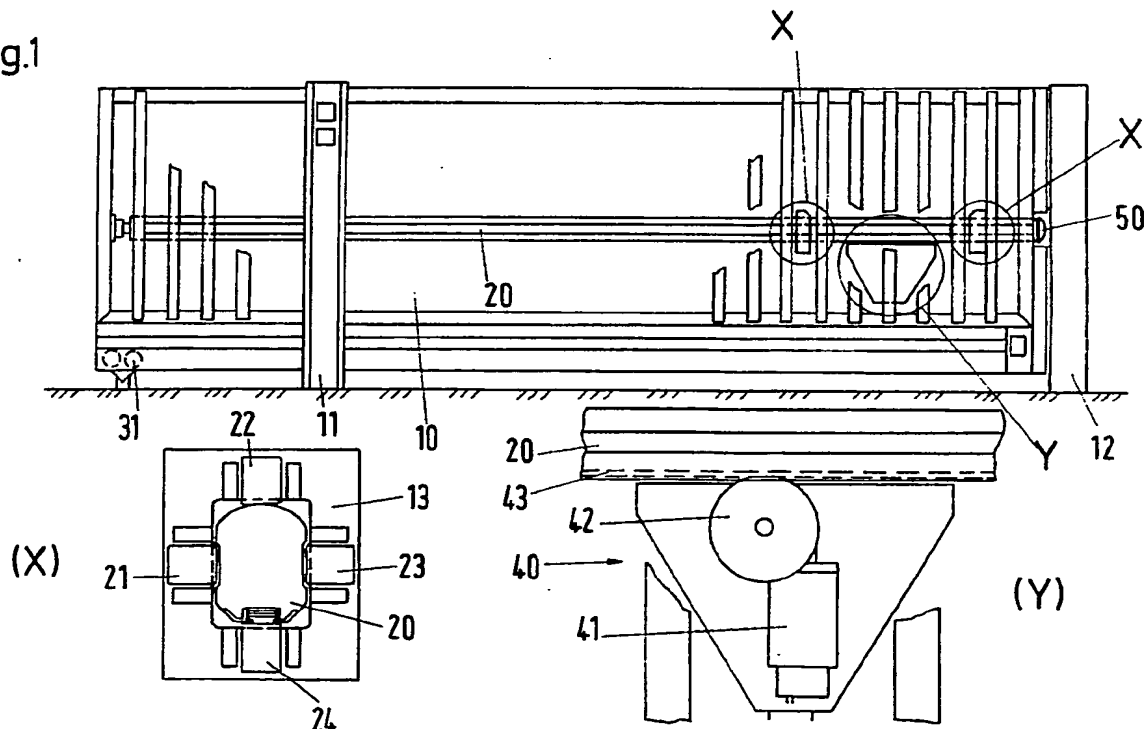
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INT CL⁵ B61L, E01F, E06B

(54) A gate arrangement

(57) An arrangement for closing an opening has a leaf 10 which can be shifted between closed and open positions and a barrier pole 20 which, in its closed position, closes the same opening, inside the leaf of the gate or laterally offset therefrom. The leaf 10 and pole 20 both preferably slide horizontally, but alternatively the pole may be rotatably mounted. The pole 20 is a temporary closure wherein the leaf 10 is arranged to be a more permanent closure for the opening.

Fig.1



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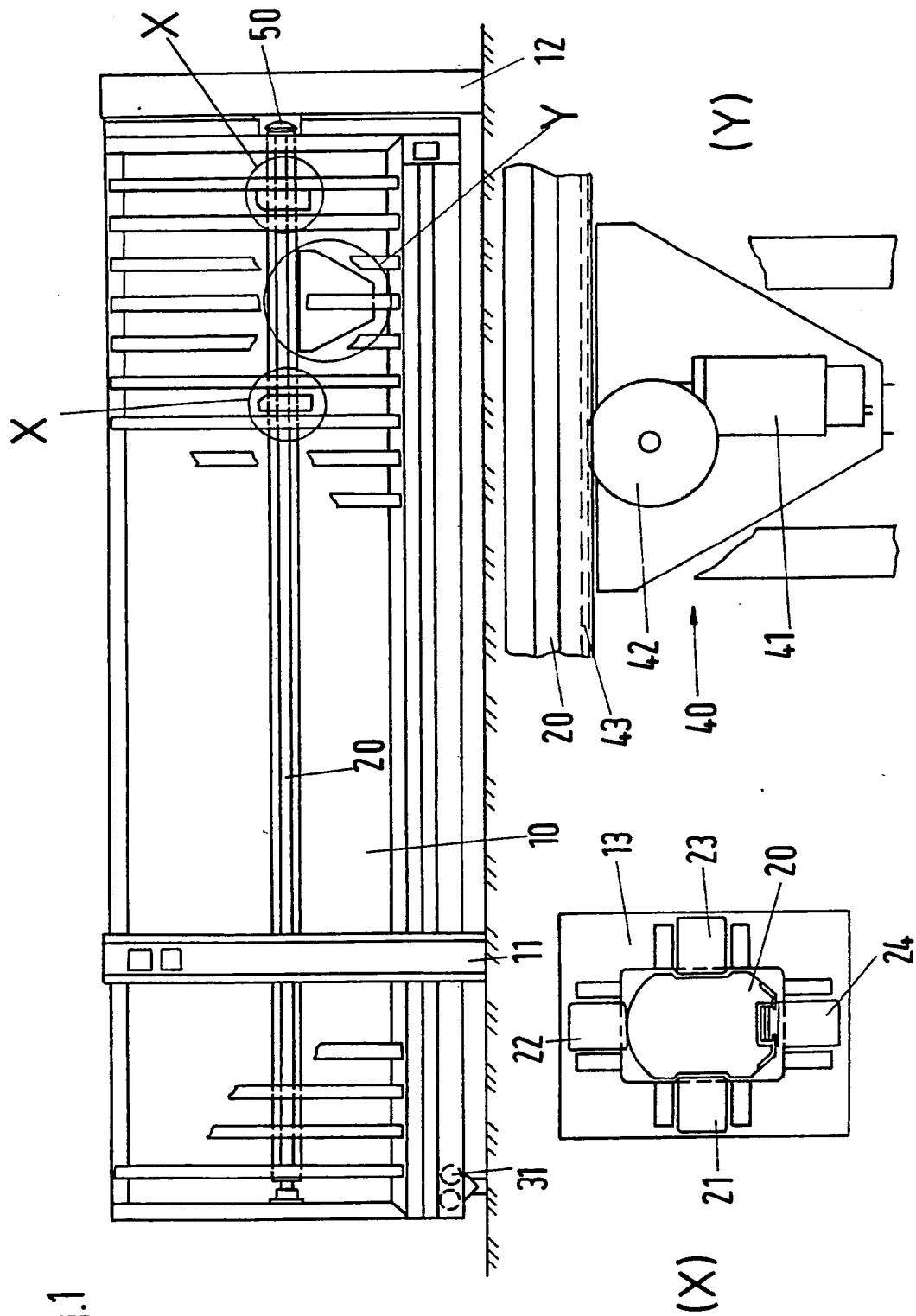


Fig.1

Fig.2

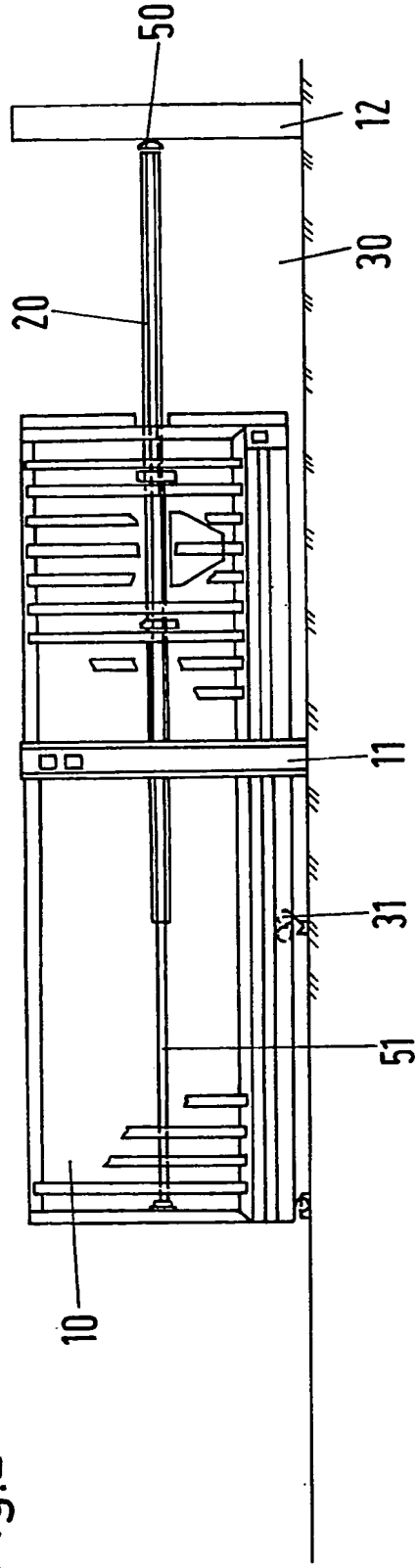


Fig.3

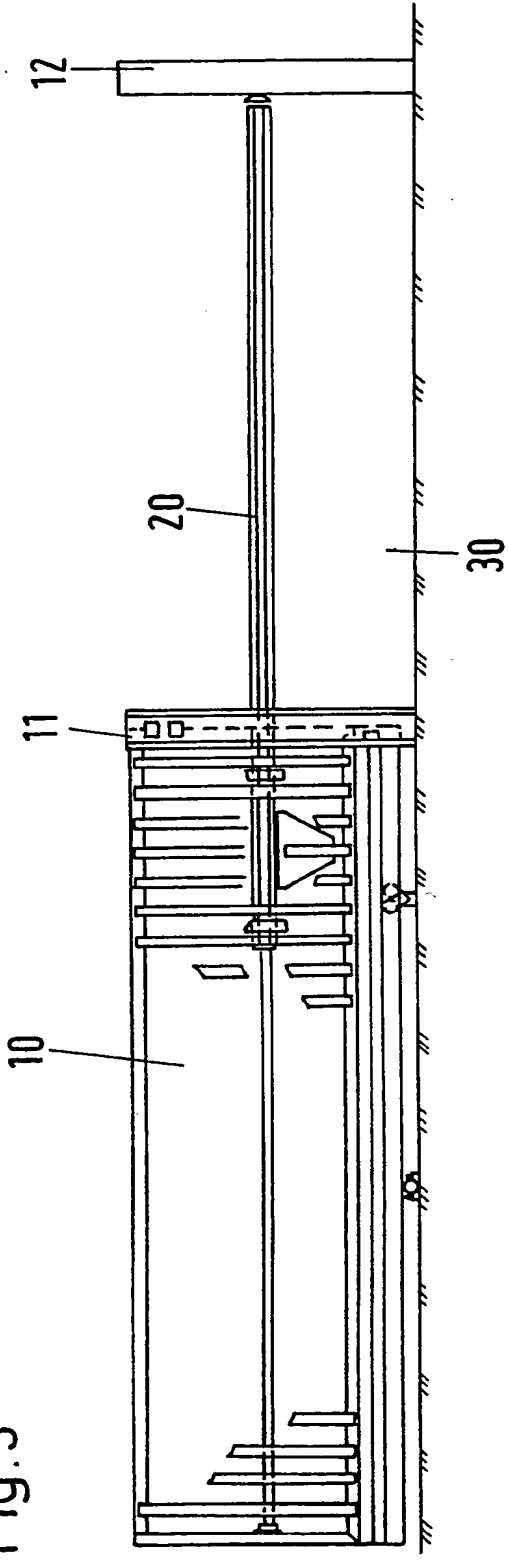


Fig.4

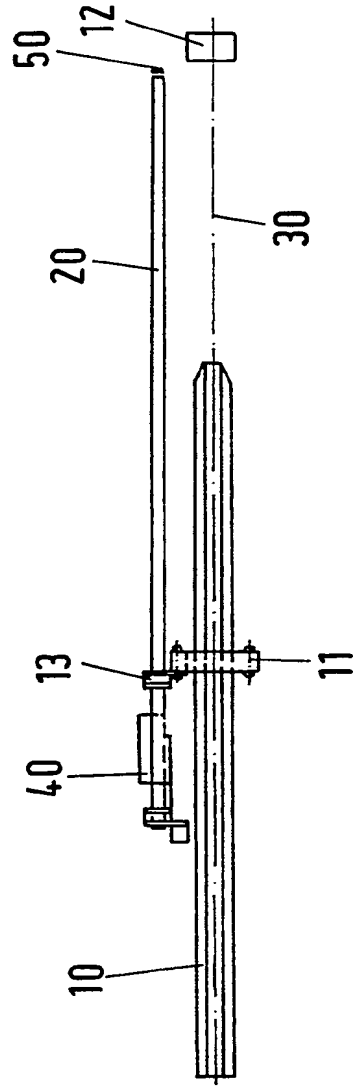
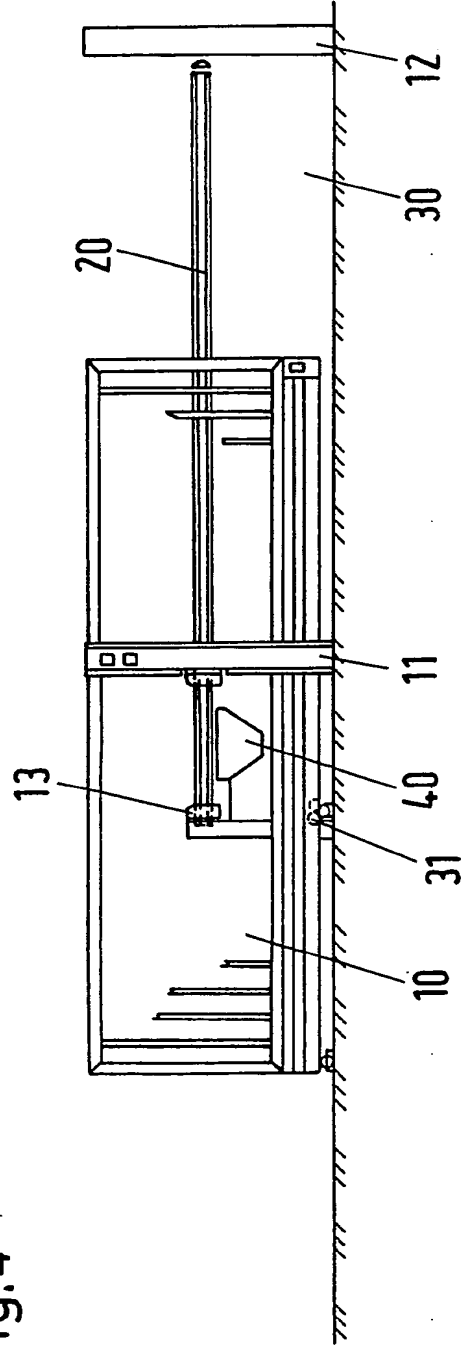
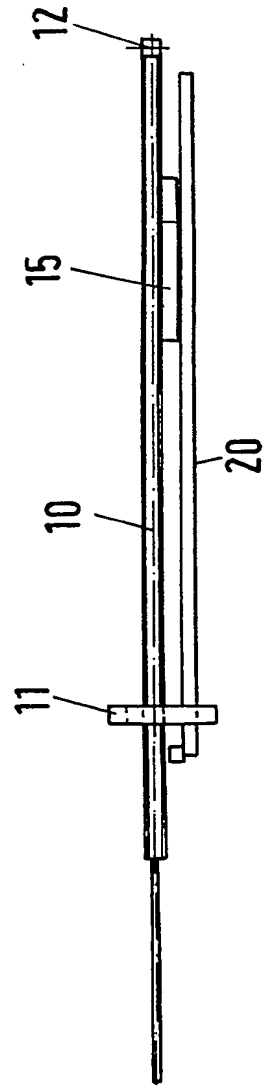
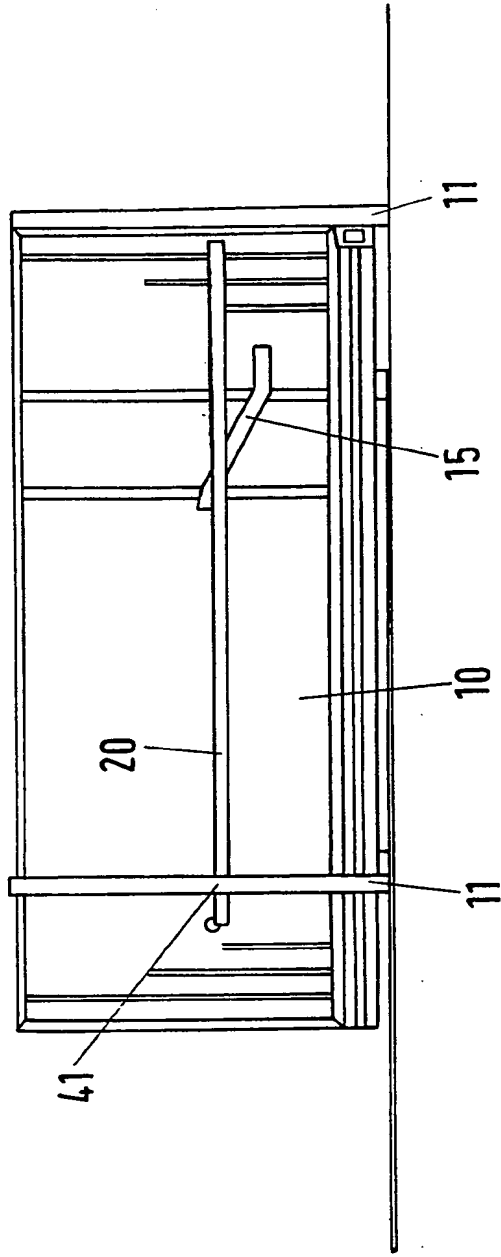


Fig.5



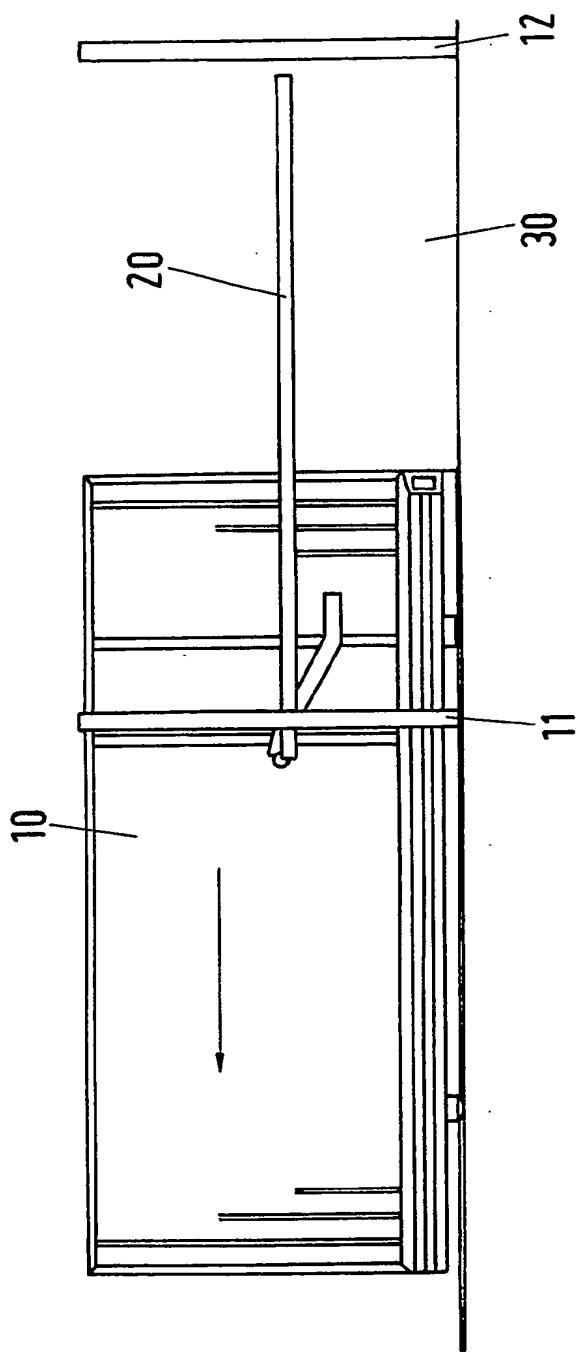


Fig. 6

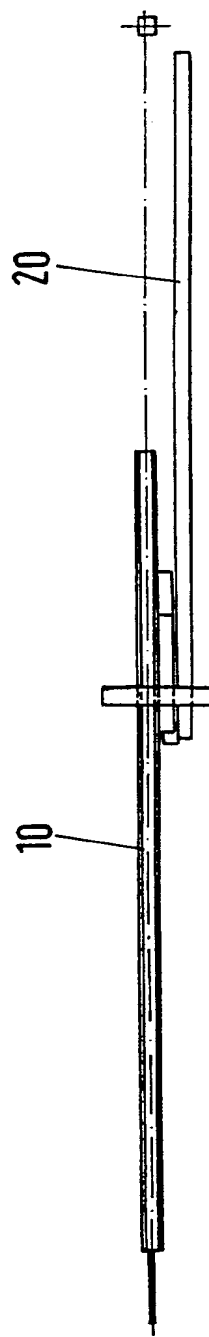
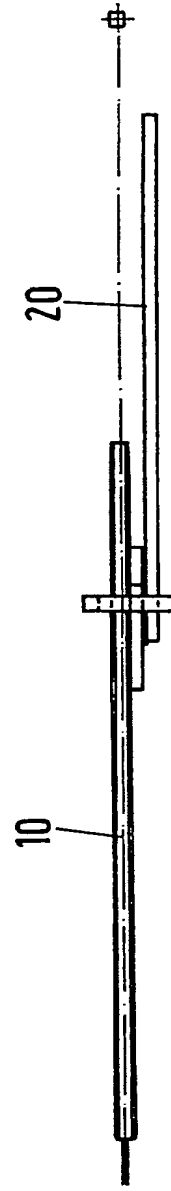
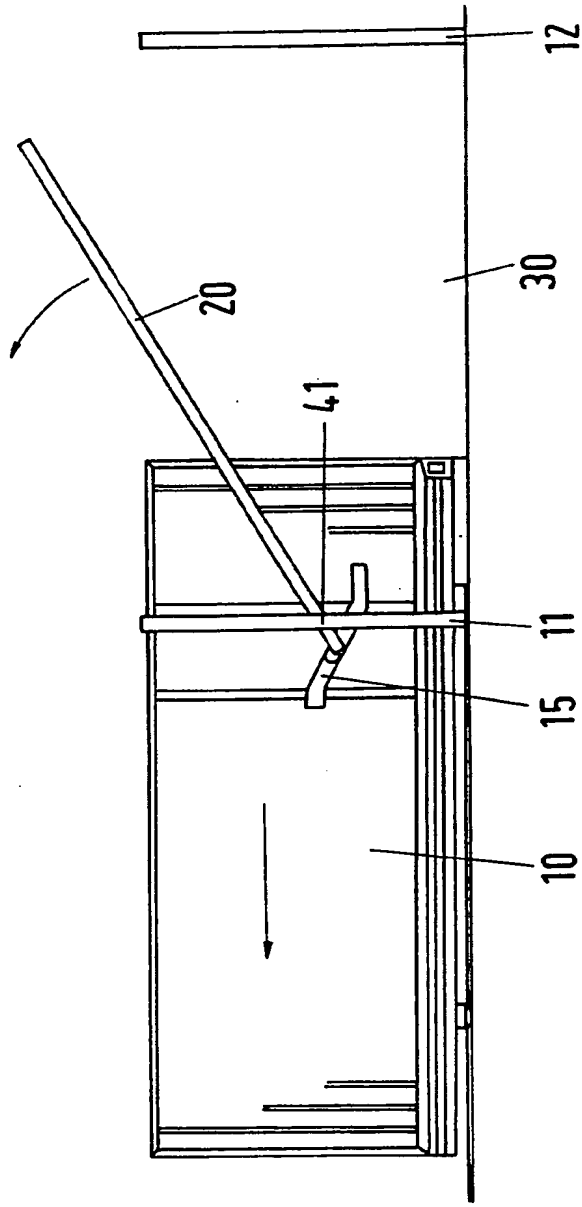


Fig.7



A GATE ARRANGEMENT

The invention relates to a gate arrangement and more particularly to a gate with a gate leaf which is
5 displaceable into the closed and open position, particularly a laterally sliding gate for closing an opening.

Gates of this type are known, for example, from
10 EP 0 392 046. By sliding the leaf of the gate open and shut, an opening such as a passage is closed. Such sliding gates may be either runner-type laterally sliding gates or cantilevered laterally sliding ones.

15 In practice, for example at entrances to companies or official buildings, the problem often arises that the opening must on the one hand be fully closed, for example at night or during public holidays, and this must be apparent from the outside. During the day,
20 however, it must be apparent to persons approaching from outside that the gate can in fact be entered but that an additional check is carried out, for example by porters or by appropriate electronic means (entitlement to access by magnetic cards etc.). In
25 addition, faster opening must then be possible than with very stable and correspondingly heavy sliding gates.

A barrier would in fact be suitable for such a faster
30 opening process, but this would not meet the higher security requirements at night.

The present invention seeks to provide a gate of the above type which allows variable closing of an
35 opening, with a mechanism which on the one hand is stable and on the other hand can be opened quickly.

According to the present invention there is provided a gate arrangement with a gate leaf which is displaceable between an open position and a closed position in which it closes an opening, wherein a
5 barrier pole is provided inside the gate leaf or laterally offset therefrom, the barrier pole, in its closing position, closing the same opening as the gate leaf.

10 It is possible with the invention to close one and the same opening either with a gate leaf which is as stable as required, is heavy and withstands attempts to break in, or on the other hand during the day or when entry is permitted to put the leaf in the open
15 position and instead to use a correspondingly more rapidly and faster operated barrier, with the additional advantage that it is immediately apparent to a person desiring access whether the opening can be entered. If the person only sees a closed barrier in
20 front of himself, he knows that he can apply to a porter or use his electronic access system to pass through the opening, for example with a vehicle.

If the person desiring access is in fact to be allowed
25 through the opening, only the barrier then still needs to be opened, and this can be done more simply because of its lighter weight. In case of need, however, the leaf of the laterally sliding gate can be closed at any time.

30 One or more barriers may be arranged in front of the leaf, behind it or integrally with it. This is particularly space-saving, an important point especially in the critical areas at vehicle entrances
35 and exits. It would therefore be advantageous in particular to have the leaf and barrier arranged as a

constructional unit.

Two preferred embodiments of the invention offer particular advantages.

5

Firstly it is particularly preferable for the barrier pole to be arranged to be movable, horizontally in its axial direction relative to the leaf of the gate.

10 With a construction of this type the selected sliding barrier has its sliding direction in the plane of the gate leaf or in a plane parallel therewith, and not pointing up in the air in the open position, in contrast with normal known barriers, particularly at
15 railway level crossings. Thus it is apparent to an observer that this is a novel arrangement.

It is particularly advantageous for the barrier pole to be placed concealed approximately half way up the
20 leaf, for example between the bars of a double-bar panel. The pole moves out of the leaf according to the opening position of the leaf (closed, half open or fully open).

25 A telescopic construction of the pole is especially favourable.

The barrier pole could be arranged centrally in the leaf of the gate or laterally offset, for example in a
30 special profile member. The pole could have approximately the same overall length as the leaf. If the sliding gate is e.g. half open or fully open during the day, the pole slides out of the leaf and half blocks or fully blocks the roadway, according to
35 the position of the leaf and the current situation.

It is preferably guided in an enclosed profile member, for example by means of a roller guide or ball bearings.

- 5 The sliding movement of the barrier pole may be produced by a motor-operated pinion by means of a toothed belt located e.g. in a groove-like recess at the underside of the barrier pole. The underside is generally preferable for reasons of weather and
10 protection, and arrangement in a groove offers additional protection and is space-saving.

Linear drive systems could also be used as the drive for the pole.

15

- The pole could also be located and mounted on or in one of the two sliding guide posts. This solution is simpler than mounting in the leaf, as the drive does not need to be in the leaf and does not need to be
20 arranged to move automatically.

- There may also be provided light strips in accordance with EP 0 392 046 B1 on the pole and/or leaf - for example with different colours or different
25 arrangements.

- In various applications it is desirable to block the partial passage area which forms during the gate opening process, for example for safety reasons. For
30 this purpose the pole may be held stationary; one end of it could be held to the abutment post of the gate by a detachable lifting or retaining magnet, and the whole pole thus drawn slowly out of the leaf but not moving relative to the opening.

35

In other applications the pole is held on, in or fixed

relative to the leaf and can be moved separately only when the leaf comes to a standstill.

5 The pole can be stopped at the abutment post or on striking persons or vehicles passing through, by means of automatic contact means for accident protection and/or light barriers.

10 A second preferred embodiment is characterised in that the pole is rotatable about a hinge arranged on a stationary post of the gate. The guide post of the gate is preferably used as the post.

15 In this embodiment a pole is used in a conventional type of movement, i.e. it is swung away particularly upwards, in a plane corresponding to the plane of the leaf or parallel with it.

20 It is preferable for the leaf and the pole to move together or with coordination in the barrier opening phase.

25 In particular a closing position is provided in which both the pole (mounted on the gate guide post) and the leaf are closed.

30 In the gate opening process the leaf is first moved to a first stopping or marking point. The pole remains closed in this phase.

If the leaf is moved beyond the first stopping point to the second stopping point, the pole is automatically opened together with the leaf by means of a linked drive and lever mechanism. The distance
35 between the first and second stopping points of the leaf may be relatively short, so that the opening

distance or opening time of the pole is correspondingly short.

5 Assuming a constant speed over the whole distance travelled by the leaf, the pole opens the vehicle passage or opening in a shorter time proportionally to the distance travelled.

10 Only one drive is necessary; the lever-driver construction provides for power transmission from the leaf drive to the pole which after all is considerably lighter.

15 Preferred embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figs. 1 to 3 show a first embodiment of the invention in three positions;

20

Fig. 4 shows a second embodiment, and Figs. 5 to 7 show a third embodiment of the invention in three positions.

25 In the three embodiments corresponding elements carry the same reference numerals.

All the Figures show an opening 30 which has to be closed by a gate according to the invention. The gate
30 has a leaf 10 which fills the opening 30 in the closed position (Figs 1 and 5). The leaf 10 is then arranged between a guide post 11 and an abutment post 12. In both the embodiments illustrated the opening direction is to the left in the drawing. The guiding of the
35 leaf 10 in the guide post 11 is shown in simplified form.

A barrier pole 20 is provided in each case. In the view in Figs. 1 to 3 the pole 20 is guided in a profile member 13 centrally in the gate leaf 10 and can be moved relatively out of it. If the leaf 10 is moved from its closed to its open position, an appropriate gear arrangement or a second drive can ensure that the barrier pole 20 remains stationary and continues to close the gate opening 30.

Two details X and Y are additionally drawn separately on a larger scale. They show the profile member 13 and the drive 40 of the barrier pole 20.

When the leaf 10 is open the pole 20 can again be moved separately into the leaf 10, which then remains stationary in its open position. Figs. 1 to 3 show the gate in its fully closed, half open and fully open position, with the barrier still closing the opening in each case.

A possible embodiment is illustrated in the detail X which is drawn separately. The cross-section of the barrier pole 20 can be clearly recognised in it, running through a profile member 13. Four runners 21 to 24 support the pole 20 from the four sides (top, bottom, left, right). The runners 21 to 24 engage in recesses in the pole (in the manner of a groove). They are mounted on elements of the leaf 10.

Guides of this type are provided as profile members 13 in Fig 1 at two spaced-apart locations on the leaf 10, to ensure that the pole 20 is supported at two locations. Additional supporting points are possible.

The profile members 13 may, for example, be attached to two opposing bars of a double-bar panel of the leaf

10 as in the embodiment illustrated. The bars of the double-bar panel are in each case drawn partly broken away or only indicated in the figures.

5 The detail Y in Fig. 1 shows the drive 40. It has a motor 41 driving a gearwheel 42. The gearwheel 42 may have a plastic tooth profile (not shown). The plastic tooth profile engages in a toothed belt 43 at the underside of the barrier pole 20. The drive 40 with
10 the motor 41 and the gearwheel 42 is fixed to the leaf of the gate, so that rotation of the gearwheel 42 leads to displacement of the pole 20 in the plane of the leaf in the axial direction of the pole 20.

15 An automatic contact portion 50 for accident protection is provided. On striking the abutment post 12 or any other obstacle it immediately stops the movement of the pole 20, so that persons passing through cannot become caught up or injured. The
20 contact portion 50 is arranged at the outermost end of the barrier pole 20.

At the opposite end a tube 51 leads from the other end of the pole 20 to a fastening point on the leaf 10. A
25 coiled cable may, for example, be taken through the tube to supply current for the pole 20. The current supply may be used, for example, for a light strip and also for the automatic contact portion 50 for accident protection.

30 Rollers 31 are also shown at the underside of the leaf 10, for supporting the leaf 10 on the ground. The leaf 10 runs on the rollers during its operation.

35 Fig. 4 shows a second embodiment in which, in contrast with Figs. 1 and 3, the barrier pole 20 is mounted not

in the leaf 10 but externally at the guide post 11. Mounting in the post 11 or on the inside between the leaf 10 and the post 11 is also possible, but the arrangement illustrated is clearer in a drawing.

5 Fig. 4 shows the gate both from above (in the lower drawing) and from the side, in this case from the side of the leaf remote from the pole 20. A half open position has been chosen, similar to Fig. 2; the mode
10 of operation and construction is otherwise similar to the first embodiment.

The drive 40 may in this case be arranged to be fixed, for example at the guide post, but otherwise
15 constructed similarly to the drive illustrated in Fig. 1. The profile members 13 corresponding to the detail X in Fig. 1 are in this case also arranged to be fixed in relation to the guide post 11.

20 A third embodiment of the invention is illustrated in Figs. 5 to 7, in each case with a view from the side and one from above. It will be seen that the leaf 10 is first opened to a first stopping position, then to a second stopping position. Until the first stopping
25 position is reached the pole 20 remains unaffected in its horizontal position. It is mounted rotatably about a hinge on the guide post 11. On reaching the first stopping position a driver 15 on the leaf 10 comes into engagement with a lever mechanism on the
30 pole 20. When the leaf 10 is pulled further open this causes the pole 20 to be turned about its hinge and swung upwards, thereby exposing the opening 30.

Only one motor drive is therefore required. The final opening of the passage by swinging the pole 20 is brought about by a slight further movement of the leaf 10 in the direction of its open position.

CLAIMS

1. A gate arrangement with a gate leaf which is displaceable between an open position and a closed position in which it closes an opening, wherein a barrier pole is provided inside the gate leaf or laterally offset therefrom, the barrier pole, in its closing position, closing the same opening as the gate leaf.
2. A gate arrangement according to claim 1 which is a laterally sliding gate.
3. A gate arrangement according to claim 1 or 2 wherein the barrier pole is arranged to be movable horizontally in its axial direction relative to the leaf.
4. A gate arrangement according to any preceding claim, wherein the pole is mounted in or on the leaf, or is movable in the or on a guide post and horizontally relative thereto.
5. A gate arrangement according to claim 4 wherein the pole can be extended telescopically from the leaf or the guide post.
6. A gate arrangement according to any preceding claim, wherein a drive is provided, which enables the pole to be held stationary on movement of the leaf.
7. A gate arrangement according to any of claims 1 to 5, wherein a drive is provided, with a circuit which allows movement of the pole only when the leaf is not moved.

8. A gate arrangement according to any preceding claim, wherein the pole is guided in an enclosed profile member.

9. A gate arrangement according to any of claims 3 to 8, wherein sliding movement of the pole is driven by a motor-operated pinion by means of a toothed belt located at the underside of the barrier pole.

10. A gate arrangement according to claim 9, wherein the toothed belt extends within a groove-like recess in the pole.

11. A gate arrangement according to claim 1 or 2 wherein the pole is rotatable about a hinge arranged on a stationary post of the gate.

12. A gate arrangement according to claim 11, wherein the leaf has a driver which engages the pole, and that engagement of the driver leads to rotation of the pole about the hinge.

13. A gate arrangement according to claim 11 or 12, wherein coupling of the leaf with the pole is provided, such that moving the leaf a predetermined distance into an intermediate position leaves the pole unaffected, and moving the leaf further causes the pole to swing into the open position.

14. A gate arrangement substantially as herein described with reference to Figs. 1 to 3, Fig. 4 or Figs. 5 to 7 of the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
'The Search report)

Application number
GB 9400405.8

-13-

Relevant Technical Fields

(i) UK Cl (Ed.M) E1J (JB, JCX, JCN, JDN, JDH, JCH, JDX, JDR)

(ii) Int Cl (Ed.5) E01F, E06B, B61L

Search Examiner
J E FULCHER

Date of completion of Search
16 FEBRUARY 1994

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
1 TO 14

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